

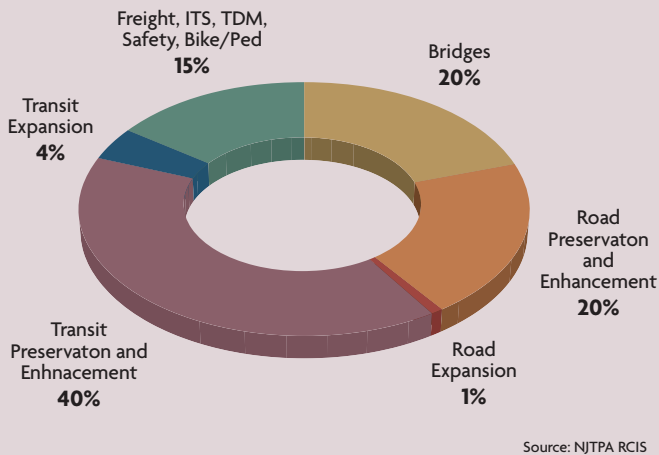
5

Strategies and Implementation

AS AN MPO, THE NJTPA seeks workable and cost-effective solutions to complex transportation challenges and does so in coordination with numerous agencies and local governments, with ongoing input from the public. Among the results are transportation improvement projects funded with the \$2 billion or more available to the region each year in state and federal funding. ■ This chapter looks at key modes, facilities and issues while referencing interconnections and overarching concerns, including access, equity, and economic and environmental impacts. The NJTPA's activities focus primarily on the earliest stages of project development where problems are explored, approaches to solutions identified, plans developed, the public consulted, financing arranged, and approvals and agreement gained among key parties. This plan provides a framework for setting priorities for these and related planning activities that will shape long-term solutions. The framework



Figure 5-1:
Regional Capital Investment Strategy Goals



includes a Regional Capital Investment Strategy (RCIS), as discussed in Appendix C, that sets targets (Figure 5-1) for allocating funds among transportation needs.

Projects and programs also find their origins in planning studies; in systematic analyses of needs called the Congestion Management Process or CMP—see Appendix F; and in assessments of how particular actions can improve transportation performance

WHAT WE HEARD

“Between our weather and driver volume, the state should really allocate more time and money to fixing the roads.”

—BERGEN COUNTY RESIDENT, ONLINE SURVEY

“Despite going virtual, you still need to maintain a state of good repair for infrastructure because we are relying on deliveries more and more and people are still using roadways and bridges and you cannot get these things delivered if you do not have the infrastructure.”

—LET’S TALK TRANSPORTATION EVENT PARTICIPANT

related to measures discussed in Chapter 4. Solutions must focus above all on giving travelers access to key destinations—in keeping with this plan’s themes of Transportation, People, Opportunity—rather than solely attending to needs on a particular facility or mode of travel.

- Prepare infrastructure for climate change impacts, including potential flooding from more severe weather.
- Maintain and upgrade roads and bridges to accommodate a growing volume of truck traffic, including increased truck parking facilities.

Roads, Bridges

As discussed in Chapter 4, the road network is subject to ongoing wear, necessitating constant repair and upkeep. Travelers often face severe congestion and reliability problems. This plan seeks to address these existing needs while also preparing for a future that will see growth in travel demand and shifts in travel patterns over the road network. The region must also prepare for impacts from climate change including increased flooding and accelerated wear, which is discussed further in Chapter 6, Environment.

The NJTPA and its partners take a “fix it first” approach to roads and bridges, using the majority of funds to maintain and preserve the system. Many of the key roads and bridges in the region were built decades ago and are due for reconstruction. Others must undergo resurfacing or other maintenance to keep up with heavy wear. The most deteriorated roads and bridges generally get the highest priority for funding. Where possible, efforts are made to perform cost-effective preventive maintenance to extend the life of a roadway and to limit long-term financial impacts.

Among the priorities for the future are the following:

- Reduce the backlog of needed road and bridge improvements and upgrade facilities to meet growing demand and enhance safety.

- Integrate roads and bridges more fully into the multimodal transportation network by modifying facilities to accommodate walking, biking, and transit modes. This includes complete streets approaches.
- Employ the latest technologies to enhance the operation of the roadway network, including preparing for connected and automated vehicles.

As noted in Chapter 4, county and local governments have responsibility for maintaining and upgrading the largest total share of road miles and about 40 percent of bridges, burdening them with substantial costs. Currently, nearly 7 percent of county-owned bridges are in poor condition and 63 percent are in fair condition.

The NJTPA Local Capital Delivery Program offers a means for counties to access federal funding to repair or replace bridges (see sidebar below). This program should be expanded to help the region meet growing road and bridge needs. However, this plan’s financial element reflects an increase in local aid funded through the State Transportation Trust fund

as part of the Local Municipal Aid, Local County Aid, and Local Bridges programs. This is particularly needed to help prepare infrastructure for growing travel demand, resiliency requirements and technology upgrades.

ROADS

Significant funding is devoted to upgrading and improving roadways to enhance their safety and ability to efficiently handle growing traffic volumes. Expanding or adding new roads is a very limited option due to high costs, environmental impacts, and the likelihood it may only temporarily relieve congestion, inducing additional traffic over the long-term.

Local Capital Delivery Program

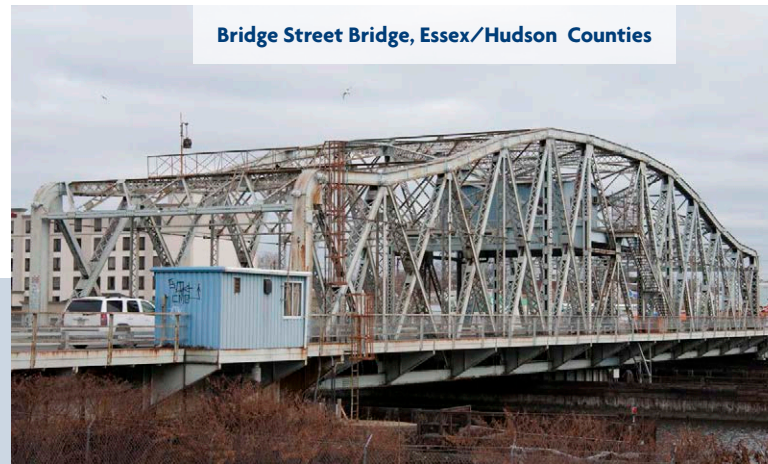
The Local Capital Project Delivery (LCPD) Program is a competitive program that provides funding to

NJTPA subregions to prepare proposed transportation projects for eventual construction with federal funding. This preparation involves completing the multi-step Capital Project Delivery Process developed by NJDOT. This process is designed to streamline project development and enables a project to be considered for inclusion in the NJTPA’s bi-annual Transportation Improvement Program (TIP). Once federal funding through the TIP is obtained, subregions oversee these final phases of work to implement the project. The initial phase of the LCPD program is Local Concept Development, which is outlined in Appendix I.

The goal of the LCPD Program is to prepare local projects for the TIP. Monmouth County Bridge S-32, Rumson Road over the Shrewsbury River, has graduated from the program and is awaiting construction. A new movable bridge will be constructed adjacent to the existing structure at a cost of \$132 million. Extensive public input, initiated during the LCPD phase, continues.

Other LCPD Program projects underway include the Central Avenue Bridge over the Newark Light Rail at an estimated cost of \$25 million and the Bridge Street Bridge over the Passaic River at an estimated cost of \$77 million, both Essex County projects; Bergen County’s Kingsland Avenue Bridge over the Passaic River, for an estimated cost of \$35 million; and Hudson County’s Clay Street Bridge over the Passaic River, at an estimated cost of \$55 million.

Bridge Street Bridge, Essex/Hudson Counties



Long-standing, proven enhancement and improvement strategies include removing bottlenecks, reconfiguring intersections (such as by installing left turn lanes), controlling road access (such as by limiting driveways and curb cuts) and changing signal timings. Increasingly, the region is looking to additional strategies:

- Adaptive signal systems are helping manage traffic on key corridors by responding to traffic conditions. They are part of broader application of Intelligent Transportation Systems (ITS) technology discussed later in this chapter.
- Modern roundabouts are successors to the traffic circle that have a smaller footprint and are proving successful solutions to traffic trouble spots.
- Complete streets, as discussed further in the Walking and Biking section, is an approach to ensure that roads accommodate all modes and all users.

Clifton, Passaic County

Implementation

In the near to mid-term, the region can expect to see significant progress in addressing its maintenance needs and reducing road project backlogs. Road preservation, enhancement, and expansion should represent 21 percent of all transportation investments, according to the RCIS.

There are several larger roadway improvement projects anticipated to be under construction in the near to mid-term. These include:

- Route 80, Riverview Drive (CR 640) to Polifly Road (CR 55), Passaic and Bergen Counties, \$665 million. Construction in 2025.
- Route 206 Projects, Somerset County, \$487 million (\$160 million remaining). Construction completion in 2026.
- Route 3, Route 46, Valley Road and Notch/Rifle Camp Road Interchange, Contract B, Passaic County, \$187 million. Construction completion in 2024.
- Route 1&9, Interchange at Route I-278, Union County, \$108 million. Construction in 2026.



- Route 34, CR 537 to Washington Ave., Pavement, Monmouth and Middlesex Counties, \$139 million. Construction in 2029.
- Route 7, Kearny, Drainage Improvements, Hudson County, \$92 million. Construction in 2023.
- Route 80, Route 15 Interchange, Morris County, \$146 million. Construction in 2022.
- Route 31, Route 78/22 to Graysrock Road, Hunterdon County, \$18 million. Construction in 2024.
- Route 9, Indian Head Road to Central Ave/Hurley Ave, Pavement, Ocean County, \$44 million. Construction in 2022.

BRIDGES

Every year, many bridges require improvement or replacement and ongoing maintenance. About 20 percent of available funding is allocated to bridges annually. The NJDOT Bridge Management System prioritizes repair and replacement by systematically assessing bridge conditions, life cycle costs, and other factors.

In addition to the over 1,800 bridges under NJDOT jurisdiction and over 2,000 county/local bridges, NJ TRANSIT owns 93 bridges in the NJTPA region (Table 5-1).

Bridges are particularly vulnerable to damage due to flooding and severe weather which will increasingly result from climate change. This presents a particular concern because bridge failures can disrupt evacuation routes from vulnerable areas, such as the shore, and movement of critical supplies in an emergency. Funding should be prioritized to improve resiliency of the region's bridges. Bridge repair or replacement projects must address resiliency concerns in design and engineering.

Table 5-1: Bridges in NJTPA Region by Ownership (2019)

BRIDGE OWNER	NUMBER OF BRIDGES
County	2,017
NJDOT	1,851
NJ TRANSIT	93
City/Town	86
Turnpike	916
Other	146
Total for NJTPA Region	5,109

Source: NJDOT Bridge Management System Database (2019)



Kingsland Avenue Bridge, Bergen/Essex Counties

Resiliency efforts have become a priority at NJDOT. The agency is developing tools for identifying assets' vulnerabilities to climate impacts (temperature extremes, extreme rainfall, and flooding) and developing techniques to factor resiliency into the agency's project delivery process.

Implementation

Among the bridge improvement projects anticipated to be under construction in the near- to mid-term are:

- Route 4, Hackensack River Bridge, Bergen County, \$88 million. Construction in 2025.
- Route 23 Bridge over Pequannock River/ Hamburg Turnpike, Morris and Passaic Counties, \$67 million. Construction in 2027.
- Route 1, NB Bridge over Raritan River, Middlesex County, \$89 million. Construction in 2030.
- Route 17, Bridges over NYS&W Railroad & RR Spur & Central Avenue (CR 44), Bergen County, \$120 million. Construction in 2031.
- In addition to NJDOT-owned bridges, there are a number of county-owned bridges under construction or expected to advance to construction over the next few years. The NJTPA assists the subregions with meeting federal requirements so that these projects can advance to construction with federal funds.
- Bridge S-32 on County Route 520 (Rumson Road) over the Shrewsbury River, Monmouth County, \$120 million. Construction in 2021.

Strategic Highway Safety Plan

The New Jersey Strategic Highway Safety Plan (SHSP) is a key part of organizing the strategies and actions that will keep the state on track towards its long-term goal to eliminate fatal and severe injury crashes. In 2020, a broad coalition of federal, state, local and private safety stakeholders coordinated to update the SHSP with a comprehensive, multidisciplinary approach that incorporates the “5Es” of safety: engineering, education, enforcement, emergency response and equity. The plan establishes statewide goals, objectives, performance measures and emphasis areas to guide safety programs and infrastructure priorities. The NJTPA plays an important role in each emphasis area.

The SHSP relies on safety data to prioritize its emphasis areas: lane departure, intersections, driver behavior, pedestrians and bicyclists, and other vulnerable road users. The 2020 SHSP also created two cross-cutting emphasis area teams focused on equity and data.

The 2020 SHSP also has a strong implementation phase that continues regular coordination among emphasis area teams to implement the most promising strategies for reducing crashes and saving lives, and to regularly report on progress across a wide array of actions. The NJTPA leads implementation of several of these strategies, which include expanding Street Smart NJ’s statewide use; exploring ways to reduce pedestrian crashes at bus stops; and identifying high crash locations on county and local roads, with an emphasis on those in underserved communities.



- Kingsland Avenue Bridge over the Passaic River, Bergen and Essex Counties, \$38 million. Construction in 2027.
- Clay Street Bridge over the Passaic River, Hudson and Essex Counties, \$64 million. Construction in 2029.
- Bridge Street Bridge (CR508) over Passaic River, Hudson and Essex Counties, \$84 million. Construction in 2026.
- East Anderson Street Bridge (02C0023A) over the Hackensack River, Bergen County, \$41 million. Construction in 2026.
- Monmouth County Bridges W7, W8, W9 over Glimmer Glass and Debbie’s Creek, Monmouth County, \$35 million. Construction in 2028.

SAFETY

Improving safety remains a top priority at the NJTPA, and safety considerations factor into all aspects of transportation planning and investment decision-making. As discussed in Chapter 4, there are more than 200,000 motor vehicle crashes in North Jersey, resulting in more than 300 fatalities and 45,000 injuries each year. Approximately 30 percent of those killed are pedestrians in the NJTPA region. The NJTPA’s safety projects and programs contribute towards meeting federally mandated safety targets to reduce serious injuries and fatalities for all.

With the understanding that any number of road deaths is unacceptable, the NJTPA analyzes crash trends and locations to help respond to the region’s transportation safety needs most effectively through its programs and initiatives. This includes its Local Safety

and High Risk Rural Roads programs, which support construction of cost-effective, high-impact safety improvements on county and local roadway facilities. These programs have invested \$312 million over the past 15 years, making the NJTPA a national leader in using these funds to improve safety.

The NJTPA recognizes that engineering alone will not eliminate serious crashes. To help provide a more holistic approach, the NJTPA developed Street Smart NJ, a pedestrian safety education campaign launched in 2013 in cooperation with NJDOT and the New Jersey Division of Highway Traffic Safety (NJDHTS). Since the initial pilot in five communities, the program has grown annually to now include more than 160 municipalities.

The New Jersey statewide Strategic Highway Safety Plan (SHSP), adopted in 2020, uses the “Towards Zero Deaths” approach to eliminating fatalities (<https://www.saferoadsforallnj.com/about>). The cities of Jersey City and Hoboken have adopted “Vision Zero” as their safety goal, following the success of Vision Zero in New York City and elsewhere in the country and around the world. Middlesex County is developing a Vision Zero Action Plan as part of its Destination 2040 initiative. In addition, many safety advocates and localities are adopting a Safe Systems Approach. This approach, encouraged by USDOT, seeks to minimize the chances for people to make mistakes and to minimize the impacts of crashes.

The NJTPA works in partnership with its member agencies, and various stakeholders to improve safety. These partners and others collaboratively developed the SHSP to guide investment in safety improvements and set policy direction for the state (see sidebar p. 60).

Implementation

The NJTPA invests considerable resources every year towards targeted, proven safety improvements and will continue and broaden these efforts. Solicitations for proposals under the Local Safety and High Risk Rural roads programs will be conducted to make full use of available federal funding.

Upcoming Local Safety and High Risk Rural Roads projects include:

- On Lakeview Avenue in the cities of Paterson and Clifton in Passaic County, approximately 11

intersections will be made safer under the Local Safety Program. Improvements will include a modern roundabout, left turn lanes, bicycle lanes, traffic signal upgrades, including pedestrian signals, lighting, drainage, and pedestrian refuge islands where feasible.

- On Garfield Avenue in Jersey City, Hudson County, an approximately 2.5-mile corridor with 31 intersections will receive ADA improvements, curb-extensions, signal upgrades, pedestrian signal upgrades, high visibility crosswalks, and lighting, also through the Local Safety Program.
- Using the High Risk Rural Roads program, approximately 8 miles of Stagecoach Road in Monmouth County in Upper Freehold and Millstone townships are slated for three modern roundabouts, high friction surface treatments, centerline rumble strips, and other safety improvements.

In addition, many large bridge and roadway maintenance and preservation projects also enhance safety where possible. This may include high visibility pedestrian crossings, improved sidewalks, bike lanes, and increased warning signage and striping. NJTPA will continue to work with NJDOT and its partners to implement and update the priorities in the SHSP.

Future safety investment directions include systemic improvements that focus on increasing safety on high crash corridors, rather than focusing on single

Somerville, Somerset County



WHAT WE HEARD

“It doesn’t have to only be about bike paths/trails. It can also be small side streets if they feel safe. It’s also important to have first mile/last mile connections to transit. It needs to be safe, easy, and convenient for people of all ages and abilities.” —LET’S TALK TRANSPORTATION EVENT PARTICIPANT

“In rural settings, emphasis must be given to bicycle safety: often, there are no shoulders on which to bike, and dedicated bike lanes are a rare exception.”

—SOMERSET COUNTY RESIDENT, ONLINE SURVEY

“Shore towns and surrounding towns by the shore see a lot of bike/walking activity but is unsafe due to the lack of infrastructure.”

—OCEAN COUNTY RESIDENT, ONLINE SURVEY

intersections or roadway sections. One way to identify needed improvements with vital local input is through Road Safety Audits (an FHWA proven countermeasure) and Walkable Community Workshops. The NJTPA supports and participates in both.

Expanding Street Smart NJ statewide and engaging new partners and communities is a priority for the NJTPA in support of SHSP. Continued partnerships with the NJDHTS, the subregions, other government agencies and traffic safety related organizations is crucial to improving safety through 2050, coupled with investment in proven safety countermeasures at priority locations.

WALKING AND BIKING

The NJTPA will continue to support improvements that make biking and walking safer and to improve access to transit for cyclists and pedestrians. Efforts are also underway to create more walking and cycling trails throughout the region, and to upgrade infrastructure and connections to provide better walk and bike access to recreational, employment, residential and other destinations. The NJTPA is assessing safety needs where off-road trails cross roadways to make systemic upgrades along busy trails.

The efforts are often part of locally led initiatives to realize complete streets (see sidebar p.64) and to expand and initiate new trails. Safe and attractive walking and biking routes are especially critical in low-income communities and minority communities,

where data shows disproportionate serious injuries and fatalities for pedestrians.

Complete Streets improve access to various destinations both directly and through connection to public transportation and they support mobility for residents with disabilities. During plan outreach, the public frequently cited making streets safer for people walking and biking as a top priority.

As discussed in a background paper for this plan (Appendix A), the NJTPA will pursue various measures to support walking, biking, and other active transportation.

Among the travel and lifestyle changes brought about by the pandemic were creative uses of street space and increased walking and biking. To create safer, socially distanced spaces, most municipalities allowed restaurants and other businesses in their downtowns to expand into the public realm on sidewalks, curbside “parklets” or parking lots. Some municipalities closed large sections of streets. It led to new appreciation by both residents and local officials of the value of public spaces and more local trips by walking and biking. The NJTPA supports the application of creative street uses such as those conducted by the TMAs and others. These trends will help reset future priorities.

Among the key infrastructure strategies for improving walking and biking identified in the active transportation background paper are:

- **Pedestrian facilities:** Completing the pedestrian network requires both sidewalks and crossing

treatments. Local regulations can require sidewalk and biking infrastructure upgrades as part of new projects, including sidewalk installations as well as crossing treatments such as pedestrian countdown timers, high-visibility crosswalks, curb extensions and leading pedestrian intervals.

- **Bicycle networks:** Building out a connected bicycle network enables less experienced cyclists to gain better access to destinations. Installing bike lanes is one way to designate safe space for cyclists. Protected bike lanes offer greater protection for cyclists where curbside space is available.
- **Dedicated trails:** Upgrading existing trails such as the Morris Canal Greenway and exploring new additions would provide even more opportunities for cyclists of all levels to comfortably travel off-road from one destination to another. Among the trails that should be explored for development and possible funding in the region are: the proposed 9-mile Essex-Hudson Greenway spanning the two counties through eight towns (Montclair,

Glen Ridge, Bloomfield, Belleville, Newark, Kearny, Secaucus and Jersey City); and the Northern Valley Greenway running through five towns in Bergen County (Tenafly, Cresskill, Demarest, Closter, Norwood and Northvale). Both would provide safe bicycle and pedestrian connections among several mixed income areas.

- **Pathways to transit:** Safe access to public transit is a key element of an effective regional active transportation network. Investment in more accessible transit infrastructure such as safe walking paths to bus stops and safe bus stop designs also addresses equity issues, since the most frequent transit users are minority and low-income residents.
- **“Calming” streets:** Reducing vehicle speed plays a key role in safety outcomes for pedestrians and bicyclists. If a car traveling 40 MPH strikes a pedestrian, the survival rate is 20 percent, versus a 90 percent survival rate if the vehicle is

Fort Lee, Bergen County



Complete Streets

Increasingly, towns are adopting and implementing policies to create complete streets, which are roads that accommodate walking and biking along with vehicles and are welcoming to travelers of all ages and abilities. These policies guide planning, land use development and infrastructure investments. The NJDOT adopted its Complete Streets Policy in 2009 and added the Complete and Green Streets Model Policy and Guide in 2019. As of March 2021, more than 169 municipalities and eight counties in New Jersey have enacted resolutions to support complete streets and several more have adopted plans, ordinances, or policies.



NJTPA programs are enhancing the ability of communities to implement complete streets. An example is a Local Concept Development Study supported by the NJTPA to help implement a complete streets plan along Main Avenue in the City of Passaic. See Appendix I for more information on Local Concept Development. In addition, since the last long-range plan update, two modern roundabouts have been constructed in Monmouth County and one in Passaic County using Local Safety Program funds. Modern roundabouts slow traffic, increase pedestrian and bicycle safety, and improve traffic flow. They can be an important element of complete streets.

NJTPA also partners with the Voorhees Transportation Center at Rutgers University and Sustainable Jersey on a competitive program to provide expert assistance to municipalities seeking to implement complete streets. This Complete Streets Technical Assistance Program has assisted 17 municipalities in seven counties since 2018. Assistance has included Walkable Communities Workshops, bicycle network plans, and a pedestrian safety demonstration project.

WHAT WE HEARD

“The focus of resources needs to start turning away from car-centric ones to ones that support cycling and walking. Current conditions are dangerous for those outside of cars; more people would walk and bike if only there was infrastructure, and if it was properly designed.”

—LET’S TALK TRANSPORTATION EVENT PARTICIPANT

Other NJTPA programs supporting regional complete streets are the Subregional Transportation Program, the Subregional Studies Program, the Planning for Emerging Centers Program, Together North Jersey Initiatives, walkability audits and Road Safety Audits. Integrating truck movement and goods movement needs are an important part of these planning efforts. The Planning for Emerging Centers Program recently completed a Hoboken Complete Streets Implementation plan and the Keyport Complete Streets.

WHAT WE HEARD

“Se necesita una mayor cobertura ferroviaria que pueda permitirnos [ir] a lugares distantes por medio del tren.” (Greater rail coverage is needed to allow us to access distant places by train).”

—NEWARK RESIDENT, ONLINE SURVEY

“Accessibility through public transit affects not only sales, but also employment. Business owners want to hire the best talent and the more ways there are to get there, the bigger the pool of applicants. It also makes it a viable option for the employees to travel on a daily basis.”

—WARREN COUNTY BUSINESS OWNER, LET'S TALK TRANSPORTATION & BUSINESS EVENT

“Unified transit systems and payment systems would go a long way.”

—JERSEY CITY RESIDENT, ONLINE SURVEY

“Accessibility is critical. Being able to get on and off trains with ease is essential.”

—BERGEN COUNTY RESIDENT, ONLINE SURVEY

traveling 20 MPH. Road diets, landscaping and signage are just a few ways to signal to drivers that they are entering zones with higher pedestrian and biking activity.

- **Americans with Disabilities Act (ADA) compliance:** Federal ADA requirements are necessary for all infrastructure improvements, but agencies and local governments can exceed minimum requirements by conducting maintenance to ensure curb ramps are clear of obstructions to allow free and convenient travel.

Implementation

As recommended in the active transportation background paper, the NJTPA, where possible, will enhance and give priority to active transportation improvements in its plans and programs. Among the key objectives will be to:

- Improve connectivity between neighborhoods and key destinations, especially in places with schools, high transit use and lower incomes.
- Encourage local partners to incorporate bicycle and pedestrian elements into roadway projects.
- Implement policies, outreach, and educational opportunities for enhancing active transportation.
- Continue to develop plans and provide technical support to advance active transportation infrastructure improvements where they are most needed.

In addition, other priorities will be to:

- Create an Active Transportation Plan for the region. This is being initiated by the NJTPA in 2021.
- Change design standards for state and local roadways to reduce driveway conflicts with pedestrians, include active transportation accommodations, and enact speed limits and roadway design that create safe bicycle and pedestrian environments.
- Encourage municipalities to adopt land use regulations conducive to active transportation, such as reducing parking requirements and revising Residential Site Improvement standards and local ordinances to create pedestrian friendly areas.
- Increase attention to equity considerations in evaluating transportation investments to consider communities most affected by the lack of pedestrian access, including low-income communities.
- Promote education and public participation regarding active transportation.
- Improve regional data.
- Expand available funding.

In all these areas, the NJTPA recognizes that successful implementation requires partnerships with county and local government, which have jurisdiction over most streets where residents walk and bike. However, a lack of flexibility in existing rules and the need to maintain traffic flow, notably on state highways, can limit the adoption of local initiatives to bolster

walking and biking and creative use of public spaces. These challenges highlight the need to balance the competing needs between land use and transportation, especially in downtown and urban areas and roadways where multiple jurisdictions may be involved.

Transit

North Jersey’s extensive transit system is integrated into the life of the region. Ridership growth has been an enduring feature of the transit system, with dips and rebounds after other crises, including 9/11 and Superstorm Sandy, and after the 2008-2009 recession. Growth has been continuing relatively unabated through periodic fare increases and occasional service disruptions. Emerging from the 2020-2021 COVID-19 pandemic, which reduced transit demand as a result of widespread layoffs and adoption of remote work, transit ridership will resume growth from a lower volume and likely continue its steady climb. Indeed, among the

Elizabeth, Union County

most frequent comments from those participating in outreach for this plan was the desire for better access to transit and improved services in all areas.

Improving transit is a key to solving some of the most difficult challenges facing the region, such as tackling road congestion, reducing dependence on inefficient auto travel, reducing air pollution, combating climate change, and providing more equitable access to economic opportunities. The pandemic made it clear that many of the region’s residents who can’t drive or don’t have access to a car rely on walking, biking, or public transit for their daily needs.

North Jersey has great advantages in pursuing improved transit. Many towns and cities date from the pre-automobile era and have walkable downtowns built around train stations and the routes of former streetcar lines. NJDOT’s Transit Village program, begun in 1999, has helped towns capitalize on the transit in their community and create the kind of development—Transit Oriented Development (TOD)—that supports convenient bus and rail service, and



WHAT WE HEARD

“Land use patterns and development should match up better with available transportation, especially transit. A large employer that is oriented toward on-site work and production should not, for instance, be located in a remote area with little to no accessibility to transit.”

—ESSEX COUNTY RESIDENT, ONLINE SURVEY

“I would love to see proactive planning to connect Sussex County to job centers. More people are moving here, lots of people already live here, and people are always talking about how to get to work outside of driving down State Route 15.”

—SUSSEX COUNTY RESIDENT, ONLINE SURVEY

walkable, complete streets. The NJTPA’s own programs, such as Planning for Emerging Centers, and its work with Together North Jersey assist towns in planning for TOD. NJ TRANSIT is partnering with developers to encourage TOD around its stations and transit hubs.

The lessons learned about creating successful transit-oriented communities have been increasingly extended to suburban, rural villages and redevelopment sites—former offices, malls, industrial facilities—including creating new mixed-use, walkable neighborhoods. Improving parking near transit hubs and park-and-ride lots is important to supporting suburban and rural transit access, though expansions require close cooperation with communities and stakeholders. Shuttle buses and shared ride services are also important for improving transit access in many areas (see sidebar p. 76).

All these efforts point toward a vision of the future in which an ever-increasing share of trips in the region can be taken on convenient, reliable transit. This would be brought about by carefully planned and staged investments in the transit system using local, state and federal funding. Among the long-term strategies to achieve the vision:

- Upgrading the reliability of existing bus and rail transit services including through improved maintenance facilities, timely replacement of old vehicles, resiliency measures, expanded capacity and other improvements.
- Adding more frequent services to respond to and bolster demand where possible.
- Extending commuter rail or light rail services along the region’s rail network, including on selected old

rights-of-way or on shared freight rail lines where available and feasible.

- Creating modern bus rapid transit systems that could bypass road congestion along with upgraded local bus services.
- Enhancing the network of services feeding and connecting to the transit system—including shuttle buses, on-demand vans and shared rides, safe and convenient bike routes and lockers, and eventually fleets of automated vehicles.
- Integrate privately operated jitneys into information systems for travel planning and seek to coordinate their operations with other mobility providers.
- Adopting new technologies to enhance efficiency, reduce environmental impacts, and provide improved customer information.
- Continuing to encourage regional land use such as TOD to support bus and rail transit.

CHALLENGES

Achieving this vision faces a number of difficult obstacles, in particular financial limitations. With much of its available funding dedicated to maintaining a state of good repair on its extensive infrastructure and vehicle fleet, NJ TRANSIT has limited capacity for expansion and must carefully evaluate a wide range of proposals. In June 2020, NJ TRANSIT issued “NJT2030—A 10-Year Strategic Plan” and a “NJ TRANSIT 5-Year Capital Plan” to guide system development. The Capital Plan notes that, “Current capital funding levels leave NJ TRANSIT struggling to keep up with the growth of New Jersey, instead of leading the way as the engine of economic growth.” In 2020 NJ TRANSIT completed the \$500 million

required investment in Positive Train Control, a federally required system to provide automated safeguards to train movements. The 2020-2021 pandemic has added the need for NJ TRANSIT to rebuild and recover ridership, including implementing new health precautions.

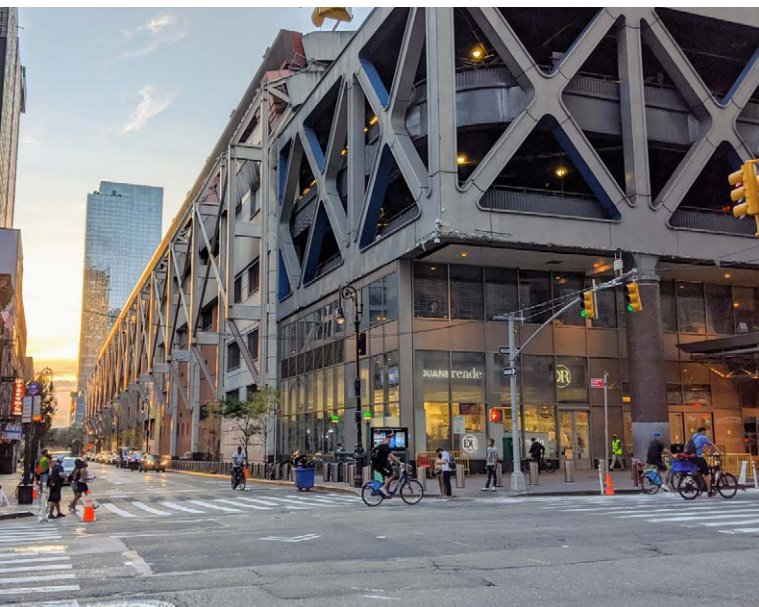
If the promise of the future vision of an expanded transit system is to be realized, increased funding and more stable funding mechanisms are needed. Some options are addressed in the financial element of this plan, Chapter 7. Even amid the constraints, the strategic and capital plans offer a path for prioritizing projects and expanding future transit services, which this plan endorses.

Other transit systems serving the region, including PATH, ferries, and private buses, face similar challenges. The following highlights some of these major transit issues:

TRANS-HUDSON CAPACITY-BUILDING

Travel across the Hudson River would be a hopeless traffic jam if not for the extensive collection of transit services. In the peak hours, seventy-eight percent of trans-Hudson trips to Manhattan are made by transit. This includes travel primarily from North Jersey, but also other parts of New Jersey and beyond (lower upstate NY, PA, DE). But key major projects must be accomplished to safeguard current trans-Hudson

Port Authority Bus Terminal, New York City



JANINE AND JIM EDEN/WIKIPEDIA.ORG

travel capacity and meet the demands of forecast growth—in particular completion of the Hudson River tunnel project and the replacement of the Portal Bridge, which in December 2020 received a federal Full Funding Grant Agreement. These projects are the NJTPA’s top transit investment priorities and set the stage for the larger Gateway Program to expand rail capacity and improve service in a multistate region (see sidebar p. 72).

In addition to the improvements included in the Gateway Program, there are other NJ TRANSIT projects that will be needed to facilitate trans-Hudson travel. These include the Main Bergen Loop, to allow trains from the north to travel directly to New York City; the Inner Storage Yard; and the need to address draw bridges and places with single railway tracks, such as in the Meadowlands. Other needs directly related to trans-Hudson travel must also be attended to, including:

Port Authority Bus Terminal—In June 2021, the FTA released its intent to begin an Environmental Assessment to replace the aging PANYNJ bus terminal. The new terminal will provide for a nearly 40 percent increase in transit rider capacity, add a 3.5-acre public park nearby, and will streamline bus operations in harmony with local community and commuter needs using the latest technology and with increased bus staging and storage space.

I-495 Exclusive Bus Lane—The Exclusive Bus Lane (XBL) is a 2.5-mile contra-flow bus lane traveling along New Jersey Route 495, leading from the New Jersey Turnpike to the Lincoln Tunnel serving 1,850 daily buses. The PANYNJ is exploring connected vehicle technologies that would allow buses to automatically communicate with one another to coordinate their movements, smooth merging and manage spacing, among other functions.

New York Penn Station—The New York Metropolitan Transportation Authority, Amtrak and NJ TRANSIT are exploring options for renovating concourses at the station. It is part of the larger planned Gateway Program, which would include constructing a new Penn Station South on an adjacent block to serve 175,000 additional passengers and 40 percent more trains.

WHAT WE HEARD

“I realize everything is focused on NYC because of jobs, activity, etc. but it shouldn’t be that difficult to get public transit from one area to another within the state.”

—HUDSON COUNTY RESIDENT, ONLINE SURVEY

“The Lackawanna train line needs to be pushed to competition especially as people are spreading out in the state with the influx of New Yorkers.”—PASSAIC COUNTY RESIDENT, ONLINE SURVEY

“A new Hudson River tunnel to connect NYC, NJ and for trains connecting DC, NYC and Boston. Avoid the same old mistakes such as adding more and more lanes to highways.”

—ESSEX COUNTY RESIDENT, ONLINE SURVEY

Over the long-term, proposals for expanding trans-Hudson capacity even further, such as extensions of the New York City subway network into New Jersey, PATH system enhancements and extensions, adding transit to existing river crossings, expanding the ferry system, automated vehicles through the tunnels and other proposals may be considered and studied.

COMMUTER RAIL SYSTEM

NJ TRANSIT’s Strategic Plan looks to implement “solutions that would allow the rail system to grow in a logical way, would increase capacity, and would allow our rail system to provide more reliable and robust service.” Beyond foundational efforts to achieve a state of good repair (Chapter 3), key improvements referenced in the NJ TRANSIT 5-Year Capital Plan to be undertaken in line with available funding include:

- Flyover tracks at key locations to reduce train conflicts and ease scheduling pressures, such as the Hunter Flyover on the Raritan Valley Line and the Northeast Corridor Midline Loop at Jersey Avenue in New Brunswick.
- Improvements to Hoboken Terminal to facilitate higher levels of rail service, improve passenger throughput, accessibility, and resiliency. This is in addition to addressing the need for supporting rail yard facilities and improving the lines servicing the station such as an upgraded Waterfront Connector to Newark, both eastbound and westbound.
- Adding rail capacity on key routes including Lehigh

third and fourth tracks and a third track between Waldwick and Suffern.

There are many other proposals for expanding the capacity and reach of the rail network that depend on resolving the capacity bottleneck at the Hudson River, as discussed above, in addition to finding solutions to funding constraints. All require detailed environmental and feasibility assessments but are possible elements for realizing this plan’s transit vision.

Among these are:

- Adding main track capacity to portions of the Bergen County, Main and Pascack Valley Lines; Morris & Essex Line, and Raritan Valley Line.
- Some of the proposed extensions of rail and light rail service, include:
 - West Trenton Rail Line
 - Raritan Valley Line
 - Bergen-Passaic Rail Service on NYS&W
 - Lackawanna Cut-off Extension beyond AndoverAdditional potential rail and light rail extension initiatives are included under Future Transit Projects in the Project Index at the end of Plan 2050.

SUBWAY/LIGHT RAIL

The PATH system serves a vital trans-Hudson market and connects key urban centers—Newark, Harrison, Jersey City and Hoboken. PATH is in the midst of a \$1 billion upgrade which includes: signal improvements that will allow trains to run closer together adding to service; new rail cars purchased to allow longer trains along with station upgrades to accommodate them; plans to overhaul the entire 350-car fleet by



Jersey City, Hudson County

2024; and continued investments in resiliency, including flood mitigation.

The PATH system, like all transit services in the region, is also challenged by the loss of customers during the COVID-19 pandemic and the need to rebuild its ridership. PATH average weekday ridership in January 2021 was down by 79 percent compared to January 2019. Impacts from the pandemic are discussed further in Chapter 4.

Studies are underway to extend the reach of the system with a connection to Newark Liberty International Airport with possibly another station in South Newark.

Also serving urban areas in the region are the Hudson Bergen Light Rail (HBLR) System, which carried 51,000 passenger trips daily prior to the pandemic, and the Newark Light Rail, which carried 20,000 trips daily. Priority HBLR projects awaiting funding include:

- The Northern Branch Corridor Project extending the HBLR from its current northern terminus at Tonnelle Avenue in Hudson County to eastern Bergen County; and

- Route 440 Expansion to connect the light rail system’s West Side Avenue route to Jersey City’s western waterfront area.

Over the long-term, further expansions of the light rail/subway systems would align with this plan’s vision for future transit. Studies by the NJTPA and its subregions have examined possibilities, such as a line from Paterson to Newark. Bus rapid transit (BRT) (see below), rather than rail, may be a viable option for these possible future expansions. Lines in some cases might run parallel to walk-bike trails on old rail rights-of-way.

BUS NETWORK

The NJ TRANSIT bus system carries two-thirds of the agency’s total ridership. NJ TRANSIT offers express bus service to the Port Authority Bus Terminal in midtown Manhattan and to the George Washington Bridge Bus Station in upper Manhattan from areas of the state without commuter rail service. Local and limited-stop NJ TRANSIT bus service within the state serves the region’s centers and nearby suburbs. Buses offer the most rapid, flexible, and cost-effective ways to expand transit services over the largest geographic area. For many residents in urban areas, they are a principal means of travel. The bus system is

supplemented by Access Link, a shared-ride paratransit service provided for people with disabilities who are unable to use the local bus service per the Americans with Disabilities Act (ADA). Counties and some localities also provide transit services so that seniors and people with disabilities have access to their daily needs.

NJ TRANSIT's strategic plan calls for purchasing new vehicles including electric buses. The pace of electrification will depend on installing adequate charging, maintenance, and other infrastructure, which can be accomplished as part of upgrading bus garages, including a new Northern Bus garage, a signature project in the capital plan. The differing operational requirements of electric vehicles also must be integrated into existing services and routes. Based on these upgrades and in line with available funding, the strategic plan calls for providing more reliable service along congested corridors serving large numbers of riders. All buses owned by NJ TRANSIT, or purchased by NJ TRANSIT for use by other carriers, are equipped with features consistent with the ADA to reduce barriers to travel.

Over the longer term, BRT may offer viable options in markets where feasible. As seen elsewhere in the country, the most successful BRT systems offer rider amenities similar to light rail and operate along dedicated rights-of-way or are able to preempt traffic signals to bypass congestion. Limited applications such as GoBus in Essex County and shoulder bus lanes on Route 9 have shown promise. Studies have pointed to some locations that may be BRT candidates:

- Upgraded service on Route 9 in Monmouth County
- New Brunswick Rapid Surface Transit study
- Bergen BRT network
- Route 1 in Mercer and Middlesex counties
- Union County BRT

Private bus carriers are also important to the regional bus system, operating long distance interstate routes, often to and from regional park-and-rides, and on local routes contracted by NJ TRANSIT. Private carriers operate as much as 35 percent of all bus route miles in the state. The pandemic has taken a severe toll on the ridership of interstate lines operated by Coach USA, Academy Bus Lines, Lakeland, and DeCamp. It is in the interest of the region and state to support the continued viability of these services given their role in providing travel options and reducing road congestion.

FERRIES

The trans-Hudson ferry system, including services from Hoboken Terminal and Weehawken in Hudson County and Monmouth County, provides an alternative transit mode and crucial redundancy to bus and rail transit in the event of disruptions. It is important for the public sector to support landside planning and connectivity to the ferries and consider capital investment to terminals, vessels and supporting facilities as needed to ensure their viability and services. New ferry services such as those under consideration in Bayonne in Hudson County, and Perth Amboy and Carteret in Middlesex County are promising strategies for complementing and filling gaps in the transit system.

Implementation

NJTPA can assist in planning and implementing the transit strategies discussed above in cooperation with the region's principal transit operators, NJ TRANSIT and the Port Authority of New York and New Jersey, and other parties. Among the key approaches:

- The NJTPA will support further development and implementation of the NJ TRANSIT 10-Year Strategic Plan and a 5-Year Capital Plan, and the Port Authority Capital Plan for 2017-2026 through its ongoing planning as well as capital programming activities to fund projects as required through the TIP. It should be noted that several proposals in

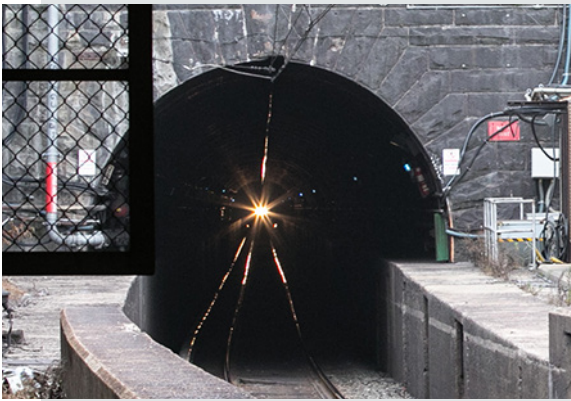
Jersey City, Hudson County



Hudson River Rail Tunnels and Gateway Program

The Hudson River rail tunnels are in desperate need of repair. Built more than a century ago, the tunnels sustained damage during Superstorm Sandy and are beyond their life expectancy. Train traffic through both tunnels was at capacity during peak periods prior to the pandemic and shutting down one tube for repairs is not feasible, as it would reduce passenger rail capacity by as much as 75 percent. The Hudson Tunnel Project, a partnership among NJ TRANSIT, Amtrak and the Port Authority of New York and New Jersey, would add a new rail tunnel, allowing the current level of service to continue while the existing North River Tunnel is subsequently rehabilitated. This project is the NJTPA's highest transit investment priority.

The new tunnel is a required element for the larger Gateway Program being led by Amtrak, a long-term plan to improve rail service along the Northeast Corridor. In addition to the tunnel, the Gateway Program includes the expansion of New York Penn Station for passengers and trains; new NJ TRANSIT rail storage capacity in New Jersey; replacing the Portal North Bridge over the Hackensack River (which has a separate full funding grant agreement in place); replacing and expanding the Sawtooth Bridges between Newark and Secaucus; construction of Portal South Bridge; expansion and modification of Secaucus Junction station; Harrison Fourth Track; dockside rehabilitation and



installation of the Bergen Loop, which would allow for one-seat rides to Manhattan on NJ TRANSIT's Pascack Valley and Main Bergen lines.

Removing the capacity bottleneck at the Hudson River is also needed to provide service to New York on existing lines that do not currently go there directly, such as the Raritan Valley Line during peak periods and the Main, Bergen, Pascack, Port Jervis and Meadowlands lines, as well as any proposed new lines, like the West Trenton line. And there are trans-Hudson projects outside of Gateway that will greatly increase transit options, such as additional tracks on

the Raritan Valley Line; the Hunter Flyover; the Northeast Corridor Midline Loop; and the waterfront connection in Hoboken; as well as the inner storage yard, and other rail infrastructure including bridges, flyovers, capacity improvement projects.

These projects are largely under study. In July 2017, the Federal Railroad Administration released a Record of Decision for a related effort, NEC Future, choosing an alternative for additional infrastructure between Washington, D.C., and New Haven, and between Providence and Boston, including investments that increase speeds and eliminate chokepoints.

In late May 2021, the Federal Railroad Administration and the Federal Transit Administration (FTA) approved the Environmental Impact Statement (EIS) for the Hudson Tunnel Project and issued a Record of Decision. This means the \$11.6 billion plan outlined above can move ahead in the process to obtain a Capital Investment Grant through FTA, as well as other potential funding sources.

WHAT WE HEARD

“Not all train stations are accessible near us, and also there aren’t any wheelchair accessible taxis/Ubers to even take us to a train/bus station. It’s very discouraging, especially for young people, who are striving to have some independence.” —HUNTERDON COUNTY RESIDENT, ONLINE SURVEY

“Cheap, frequent, and widely available public transport, whether in the form of buses or trains, is very important to those who are disabled, elderly, or poor. Especially those in more rural communities, the availability of this type of transport is often the only means for some people to get out of the house.” —HUNTERDON COUNTY RESIDENT, ONLINE SURVEY

these plans could take years to be realized and will continue to evolve as NJTPA updates its own long-range plans.

- Studies conducted by the NJTPA and its subregions—including through the Subregional Studies program—will continue to explore new transit options to meet needs around the region, which can lay the groundwork for future expansion projects. An example is the 2020 Paterson Newark Transit Market Study.
- Studies and planning programs, including Planning for Emerging Centers and planning initiatives conducted in conjunction with Together North Jersey, will promote and support TOD in the region, including efforts to realize complete streets which complement TOD. Examples include the recent Planning for Emerging Centers projects supporting Keyport’s Complete Streets Policy and Implementation Plan and Raritan’s Sustainable Economic Development Plan.

NJTPA will continue to support and fund the work of the eight TMAs serving the state, which have a crucial role in working with employers and in assessing local needs to integrate transit into communities and local economies.

LOCAL MOBILITY SERVICES

Local mobility services, such as county and local transportation services, Access Link ADA paratransit, and shuttle buses to and from transit are crucial in providing travel options for those who do not have access to a car, cannot drive, or whose travel needs cannot be met with fixed route transit. This includes many

older adults, people with disabilities, and low-income residents. These services provide transportation to jobs, shopping, education and other destinations, either directly or through links to/from transit and serve rural areas without sufficient population density to support fixed route transit. In addition to meeting needs of residents, travel options for local mobility help reduce travel demand as part of Transportation Demand Management (TDM) strategies (see sidebar p. 76). Based on 2019 data, there were over 700,000 annual passenger trips on various shuttles operating in the NJTPA region, including on the following services:

County and Local Transit Services—County transit providers and many local agencies provide a wide variety of shuttles serving different trip purposes that cannot be easily met by more traditional, fixed route transit. These may have fixed or flexible routes or may operate as on-demand services. They can be operated by counties, municipalities, TMAs and other non-profits, employers, medical facilities, and others using a combination of public and private funding sources. Many of these services receive additional support from state and federal transit programs targeted to senior citizens and the disabled, including funds set aside from state casino revenues.

Access Link—NJ TRANSIT operates the Access Link complementary paratransit service that shadows its local fixed route bus and light rail services to provide more transportation options to customers who are unable to use the fixed route services, in accordance with the Americans with Disabilities Act. NJ TRANSIT recently introduced an app-based travel

Trends and Emerging Technologies in Mobility Services

Several trends and emerging technologies are anticipated to change the way that mobility services are provided over the next four to 10 years. These will present challenges as well as opportunities to enhance transit connectivity.

Among these trends are:

- Warehousing and distribution is a large and growing job market that can be challenging to serve by fixed-route bus transit. Distribution centers, both urban and rural, are often located far from established bus routes, have extended working hours, and may be part of a spread-out campus. Access to these jobs can be improved by creating public-private partnerships with agencies, TMAs, and industrial park developers to provide reverse commute shuttles, vanpools, and carpools.
- Transportation Network Companies (TNCs) such as Lyft and Via are playing an increasing role in supplementing transit and paratransit. For example, Jersey City partnered with Via to provide on-demand, dynamically routed shuttles to help residents travel from outer neighborhoods to the downtown, PATH, and light rail. The Hunterdon Healthcare Center Foundation is working with goHunterdon TMA and Lyft to provide transportation to medical appointments. NJ TRANSIT launched a “TNC Challenge Program” with some of the county specialized transportation departments to connect residents with transit stations, places of employment, retail establishments, and healthcare appointments while reducing the wait time between making a reservation and taking a trip.
- The concept of “Mobility on Demand” would allow for the integration of multimodal transportation services for consumers to plan, reserve, and purchase services that meet their transportation needs. If implemented, this coordinated trip planning could make it much easier for the public to make transit trips that link two or more services.
- Developments in autonomous vehicle technology lends itself to the creation of automated shuttles. Many shuttles have the potential for the introduction of partial or full automation because they travel on a regular path, at neighborhood speeds, and may operate in small downtowns or single use districts such as office or industrial parks. NJ TRANSIT is working with the Rutgers University Center for Advanced Infrastructure and Transportation to test low-speed automated shuttles at Fort Monmouth in Monmouth County.



ANDY AMBROSIO (VIA)



information and reservation system for Access Link to enhance the customer experience.

Employment Shuttles—A wide variety of employment shuttles operate in the region, provided by county agencies, TMAs, other nonprofits, and private employers. These may take the form of a fixed-route bus, a point-to-point shuttle, or an on-demand car service. Of particular importance are last mile services connecting homes and workplaces with transit hubs. Some of the shuttles are supported by NJ TRANSIT’s NJ-Job Access Reverse Commute (NJ-JARC) program. The NJTPA Local Mobility Initiatives Program, funded by the federal Congestion Mitigation and Air Quality Improvement Program (CMAQ), also funds shuttles.

First Mile Shuttles—Shuttles and other mobility services also connect residents from their home to rail, bus, or ferry. Many are funded by municipalities or developers as a local amenity.

Implementation

Implementing local mobility services relies on coordination between NJ TRANSIT, counties, TMAs, and municipalities. NJ TRANSIT administers most of the state and federal funding that supports these vital services. The NJTPA plays a coordinating role and works to advance the recommendations of the regional Coordinated Human Services Transportation Plan which was created in 2017 to guide meeting the needs

activities that serve to reduce traffic congestion and air pollution include promoting and supporting commuter vanpools and carpools; working with employers to enact flextime, telecommuting and compressed work initiatives; managing shuttle services; and promoting walking and bicycling. TMAs also play an important role in construction mitigation and emergencies, providing timely information about road and transit conditions and alternative modes of travel.

Implementation will also be carried out in cooperation with subregions, NJ TRANSIT and other agency partners, and a host of public and private partners, many of whom started working together under the Together North Jersey umbrella, in addition to the TMAs. Examples of the kinds of services to be supported and expanded include first mile shuttles such as:

- **Fort Lee Parking Authority**—Offers morning and evening shuttles to and from the Edgewater Ferry Terminal.
- **EZ Ride**—Operates multiple shuttle routes that connect apartment complexes in the Meadowlands area with NJ TRANSIT rail stations, PATH, and New York City.
- **Community based**—Some communities sponsor shuttles to regional railroad stations, with examples found in Livingston and West Orange to connect to NJ TRANSIT Midtown Direct service.

The NJTPA will continue to support Local Mobility Initiatives Program, funded by the federal

WHAT WE HEARD

“Create more local, electric, green, shuttle services to connect residents with train stations, etc. Try to get cars off the road where this is do-able, such as commuting to a nearby train station.”

—ESSEX COUNTY RESIDENT, ONLINE SURVEY

of seniors, low-income people, veterans, and individuals with disabilities.

The state’s eight TMAs are particularly important in implementing local mobility and TDM strategies. The NJTPA funds, administers, and coordinates the statewide TMA program. These organizations work with employers, governments, and the public throughout New Jersey to help people get where they need to go efficiently and safely without driving alone. TMA

Congestion Mitigation and Air Quality Improvement Program (CMAQ), through periodic solicitation of proposals. Examples of CMAQ funded services include:

Essex County Night Owl—Provides late night shuttle transportation from homes in Newark and nearby communities to Newark Penn Station for bus connections to Newark Liberty International Airport, PATH trains and other connections.

Transportation Demand Management

Transportation Demand Management (TDM) involves regional policies and strategies that increase traveler choices while also minimizing the negative impacts of single-occupant vehicle travel on congestion, air quality, and safety. Plan 2050 is committed to advancing TDM strategies through NJTPA planning activities and programs. To this end, in 2021, the agency completed a TDM and Mobility Plan (Appendix G).



TDM encompasses a host of strategies and programs. These include shifting priority away from driving alone, and can include monetary incentives, carsharing or bike sharing, dedicated bus lanes, protected bike lanes, and lowering off-street parking minimums for new developments; working with employers to host carpools or vanpools or provide incentives to take transit; public transit improvements, such as accurate real-time arrival information, reduced fares for some trips, and easy to use wayfinding; and marketing the benefits of reducing driving. TDM strategies also embrace new technologies including on-demand services and automated services where feasible.

The NJTPA has supported these and other strategies, particularly through its work with the state's eight TMAs.

Exploring new mobility options will be important for a dynamic, multimodal, resilient transportation system that meets the needs of varied users. Priorities from the TDM and Mobility Plan include the following:

- Institutionalize a “complete streets” approach to designing, building, and maintaining streets, which has the potential to increase the convenience and safety of walking and biking, thereby reducing the need for vehicle trips.
- Help municipalities integrate sustainable and equitable transportation initiatives into land use and development decisions.
- Support telework and teleservices, which reduce trips and can increase access to employment, healthcare, education, socializing opportunities and social services.
- Create a “Mobility on Demand” platform to enhance traveler information, trip planning, and payment across multiple services.

- Fund first/last mile solutions including transit shuttles, car services, micromobility systems, and bicycle/pedestrian networks connecting people from home to transit or from their transit stop to their workplace/destination.
- Enhance NJRideshare.com, New Jersey's carpool and vanpool matching system to better meet the needs of commuters and non-commuters alike.



Somerset County DASH—Connects residents of Bound Brook and New Brunswick with places of employment in Franklin Township.

Union County Route 22 Safety Shuttle—Loop shuttle connecting NJ TRANSIT bus stops with places of employment and retail establishments along the Route 22 corridor.

FREIGHT

The NJTPA region is a growing hub of freight distribution and global trade for much of North America, helping North Jersey retain and attract businesses and expand its jobs base. This requires an increasingly integrated multimodal network of roads, rail lines and terminals, port facilities, air cargo facilities, warehouses, and distribution centers. But to remain competitive, the region must continue to address freight infrastructure needs and prepare for an anticipated 16 percent growth in freight volume by 2050. This requires investing in and optimizing operations of the various modes and facilities, as highlighted below. Several issues cut across the entire freight sector:

- The pandemic has accelerated key trends (such as e-commerce, “buy online, pick up in store, or BOPIS” and domestic production of critical goods), increasing the demand for industrial facilities and prompting new business practices in supply chains

economy, expansion increases the need to mitigate impacts on communities including noise, pollution, traffic, and loss of open space, which can be accomplished through various cooperative strategies involving freight-related companies and communities.

Truck movements—Nearly all freight moves by truck for part of its journey, whether across long distances or locally. The region’s major truck routes are the New Jersey Turnpike, I-78, I-80, I-287 and NJ 17. As freight volumes grow these roads will see even higher truck volumes. Among the issues:

- Maintaining and improving pavement, bridges, and other infrastructure, as discussed elsewhere in this chapter, is required for safe, efficient truck travel. This includes turning lanes with signals timed for truck movements, sufficient bridge clearance, enhanced rail access, and upgraded intermodal transfer facilities
- Enhancing infrastructure that connects the Port complex and Newark Liberty International Airport, the region’s air cargo hub, with distribution centers and customer facilities.
- Sufficient and safe truck parking and rest areas must be provided to avoid the hazards of unauthorized truck parking on roadway shoulders and interchanges. These facilities provide safe, secure places for truck drivers to rest and enable drivers

WHAT WE HEARD

“People complain about tractor trailers on local roads, but everyone wants choice at grocery stores and on time deliveries. ...Trucks play a big role in [the] consumer goods-based market. We need to find ways to better accommodate them so people are safer and the vehicles are cleaner and remove them from peak hours.”

— LET’S TALK TRANSPORTATION EVENT PARTICIPANT

as discussed in a background paper, *COVID-19 and North Jersey Freight* (Appendix A).

- Labor shortages affect all modes, particularly trucking. Strategies include building awareness of available jobs, enhancing training and apprenticeship opportunities, recruitment, retention and improving accessibility options for workers to reach facilities.
- While the sector creates jobs and supports the

to meet federal hours of service regulations, allow local staging of trucks awaiting pickups and drop offs and provide emergency parking during storms and other disruptive events.

- The region must plan for the introduction of additional technologies, including semi-autonomous and fully autonomous trucks and alternatively powered trucks (including electric and natural gas).



Newark, Essex County

- The acceleration of e-commerce has greatly added delivery trucks on local roads requiring more attention to local impacts and coordination between freight companies and communities.

The Port and Marine Cargo Movement—The region continues to see larger vessels coming to the port, thanks to the added clearance below the Bayonne Bridge, increased use of the Suez Canal by carriers, and increases in global trade. To guide planning and accommodation of marine cargo movement for the next 30 years, the Port Authority’s Port Master Plan 2050 is a comprehensive and flexible roadmap that charts the course for future growth and development at the Port of New York and New Jersey. The 30-year plan takes a holistic look at the port, including cargo container facilities, automobile terminals, dry and liquid bulk cargo operations, cruise terminals, and ferry landings and maps out the next generation of land use and infrastructure development projects that will allow the port to remain among the nation’s leading maritime gateways.

Among the most pressing issues in the NJTPA region are:

- Adequate channel depth and width must be maintained to accommodate these larger vessels as well as newer ultra-large container vessels beginning to serve the East Coast.
- Continued improvements of landside road and rail connections to maritime terminals and facilities are needed to meet rising maritime traffic.
- Domestic waterborne movement of cargo on designated “marine highways” or via “short sea shipping” is anticipated to grow by 2050, augmenting road and rail movements. Two key sites are Port Raritan at the Raritan Center industrial park, under development, and the New York New Jersey Rail carfloat, which moves from Greenville Yards in Jersey City to Bush Terminal Yard in Brooklyn and was recently enhanced by the Port Authority. Infrastructure investments at these and other locations must be considered.

Warehouses, Distribution Centers and Production Facilities—The region has one of the greatest concentrations of these facilities in the nation. They will continue to expand as e-commerce grows and national policies support domestic production of key commodities. New or expanded facilities have provided opportunities for reclaiming

brownfields and underutilized properties in the NJTPA region. However, there are places in the region—particularly in rural areas—where warehousing may not be desirable. These operations must be effectively integrated with other land uses, particularly in greenfield locations, and into communities. Sufficient transportation options must be provided for workers to reach freight-related facilities.

Freight Rail—The freight rail system continues to face capacity constraints and issues related to legacy infrastructure. The region must upgrade its freight rail infrastructure to support national standard Plate “F” rail cars, which are 17 feet tall, 10.5 feet wide, and can carry up to 286,000 pounds. In addition, certain rail improvements are needed to accommodate the growing rail share of cargo movement at the port. The NJTPA Freight Concept Development Program, along with efforts through the Freight Rail Industrial Opportunities (FRIO) Corridors program with partner organizations can help address these needs along with investments of the railroads, the Port Authority, and NJDOT.

Air Cargo—Newark Liberty International Airport hosts significant Federal Express, UPS, and other cargo facilities. Strategies to address needs involving moving freight to and from the airport include improved access to air cargo facilities, improved connections between the air terminal and offsite warehouse and distribution centers and improved signage for freight-related access and facilities.

Implementation

The NJTPA’s implementation of freight strategies to address regional needs is directed by the Freight Initiatives Committee (FIC), composed of local elected officials and agency representatives from the NJTPA Board. The committee’s bimonthly meetings serve as a forum for discussion of regional freight activities and an important means for disseminating information. Private sector participation in these meetings encourages coordination on freight matters. Implementation steps will include the following:

- The NJTPA will continue serving on NJDOT’s Freight Advisory Committee and act as subject matter experts on assessments, projects, and studies. This includes support for the Statewide Freight

Plan, a federally required document being updated to provide guidance for future planning activities, with expected completion in fall 2022.

- The NJTPA also provides support to freight-related efforts of partner agencies, such as NJ TRANSIT and the PANYNJ, as well as subregions that are undertaking freight analyses and studies. Through the Metropolitan Area Planning (MAP) Forum and the Council on Port Performance, NJTPA collaborates with partner agencies in a four-state area on multi-jurisdictional freight issues and topics.
- The NJTPA will continue its FRIO Corridors Program, which focuses on systematically identifying and addressing impediments to national standard rail freight car access.
- NJTPA will continue to maintain and expand the Goods Movement Strategies for Communities webtool to facilitate development of practices that can help make freight-related operations less potentially disruptive to host and neighboring communities. The tool lists and describes practices that have proven effective in addressing community impacts of truck traffic.
- Truck parking strategies will be the focus of continuing collaboration with partner agencies in the state and wider multi-state region.
- The NJTPA continues to monitor and analyze trends and conditions with information regularly

Hoboken, Hudson County



Freight Concept Development Program

More than 500 potential freight projects have been identified in planning studies conducted in the NJTPA region over the past 10 years. But many lacked a clear path forward to implementation. To address this need, the NJTPA developed the Freight Concept Development Program (FCDP). This program builds off the NJTPA's Local Capital Project Delivery Program. Subregions submit applications to advance projects through the program. FCDP studies include



data collection, community outreach, assessment of environmental impacts, development of potential alternatives and selection of a preferred alternative.

Projects that graduate from

the FCDP are well positioned to seek grant funding for eventual final design and construction.

Three projects advanced during the program's pilot phase, FY2019-FY2020:

- Phillipsburg South Main Street Bridge Rail Clearance Project in Warren County
- Hackettstown Bridge over Drain Weight Restriction Elimination Project in Warren County
- Dover and Rockaway Rail Realignment Project in Morris County

Two projects will advance in FY2021:

- Berkshire Valley Road Truck Circulation Project in Roxbury, Morris County
- Port Reading Secondary South Main Street Grade Crossing Elimination Project in Bound Brook, Somerset County

added to the NJTPA website and shared with the FIC. The 2050 freight forecasts developed for this plan will be updated as data becomes available.

- The Freight Concept Development Program is another key initiative which investigates project concepts and advance them for eventual funding (see sidebar).
- This plan supports critical freight infrastructure improvements to the roads, rails, and marine corridor. An example of this is Port Street Corridor Improvement Project, the modernization of an approximately 2.9-mile section of roadway at the north entrance of Port Newark and the Elizabeth-Port Authority Marine Terminal. The project includes replacement of the Corbin Street Ramp, the realignment of portions of Corbin Street, Port Street, and Kellogg Street, and the improvement of several other nearby intersections in Newark, Essex County. A federal Infrastructure for Rebuilding America (INFRA) grant was awarded to the Port Authority in 2021 for this project.

Freight is integral to all aspects of the region's economy and is considered in all transportation planning and investment decision making at the NJTPA. Freight issues are important to the NJTPA's resiliency efforts in order to sustain supply chains through major disruptive events. Additionally, safety planning must consider reducing crashes involving trucks and ensure that autos, trucks, bicyclists, and pedestrians can move in a safe and efficient manner.

TRANSPORTATION TECHNOLOGY

Transportation technology is helping make the transportation system safer and more efficient. Emerging technologies such as connected and automated vehicles promise even more dramatic benefits over the life of this plan. But the NJTPA and other agencies must guide how such new technologies are integrated into the transportation network and ensure they are applied equitably and respond to the region's mobility needs. In goods movement and deliveries, technologies such as drones, autonomous delivery vehicles, and using real time information to make deliveries most efficient are already coming into use and will continue to grow. A background paper prepared for this plan (Appendix A) explored how the region can take advantage of transportation technologies.

One long standing issue identified in public outreach that technology can address is the need for greater flexibility in the on-road transit system (currently primarily buses and shuttles) to meet existing and emerging needs. Technology that allows for on-demand, potentially autonomous, microtransit (small vehicles summoned by smartphone apps) responds to this need as a way to meet the “many to many” relationships—travel by large numbers of people to a number of widespread locations, as opposed to one central area—that characterize travel in the NJTPA region. Technology can also provide real time route and service information at kiosks in addition to what is currently available on smart phones and could include many travel options such as shuttles and bike share.

In addition, which kinds of energy are used, and how it is produced and distributed, will dramatically shape transportation in the future. Electric vehicles or vehicles fueled by other means are increasing, reducing air pollution from transportation. Charging innovations, such as roadways that can charge vehicles in motion, could solve the “range anxiety” that keeps many from switching to all electric vehicles, even as charging stations become more common.

Technology such as adaptive traffic signal systems, traffic operations centers and multiagency incident response networks are already helping reduce traffic congestion and its enormous economic costs while also improving safety. On the transit network, technology is improving efficiency and giving riders real time information on the location and arrival times of buses and trains.

These innovations are examples of Intelligent Transportation Systems, or ITS. In the near-term, one priority of ITS implementation is expanding adaptive traffic signal systems throughout New Jersey, helping significantly reduce delay on key road corridors. Such systems can give “signal preemption” to speed bus trips, an important goal for expanding transit convenience and use.

Many ITS systems gather real time data from roads and rails, used for both managing operations and increasingly analyzing patterns for use in transportation planning. Under federal law, states develop and maintain an “ITS Architecture” to ensure that

various transportation technologies can work together smoothly and effectively.

Within the next decade existing ITS applications will be improved and implemented more widely, and connected and automated vehicles (CAV) will come into use.

Connected Vehicles use short to medium range communications to interface with infrastructure and other vehicles, allowing coordination of movements to minimize crashes, reduce congestion and make more efficient use of road space, among other applications.

Automated Vehicles provide varying levels of automation to reduce the role of drivers in directing vehicle movements. Many first-generation automation features to assist drivers—such as blind spot information system, and adaptive cruise control—are available in the latest vehicle models.

These systems promise to drastically reduce crashes—80 percent or more with fully automated vehicles—and to create a wide range of possibilities for more efficient transportation, new travel options, and even new ways to reorganize community land use.

Among the possibilities of emerging transportation technologies are fleets of driverless vehicles available on-call, platoons of automated long-haul trucks on highways, roadside systems orchestrating the safe and efficient movement of vehicles and downtown land use transformed by reclaiming parking and other spaces now used for private autos for walking, biking, and other uses.



USDOT

Best estimates are that driverless vehicles will emerge in limited forms in the next decade, at least initially operating in constrained areas at low speeds. Fully capable automated vehicles may take decades more and may await breakthroughs in technologies and computing. In the meantime, the NJTPA supports pilot initiatives in the region, such as the Middlesex

Among other activities, this includes cooperation with NJDOT in maintaining the state's ITS Architecture, Transportation System Management and related programs; support for TRANSCOM which gathers and disseminates data on traffic and travel conditions in real-time; funding and support for improving technologies employed by NJ TRANSIT,

WHAT WE HEARD

“Capacity can be created through improved traffic management that gives due priority to freight transport demand. Improved traffic management can also reduce the considerable environmental impact caused by excessive emissions produced by the transport sector.”

—SOMERSET COUNTY RESIDENT, ONLINE SURVEY

County Smart Mobility Testing Ground, located in New Brunswick in partnership with the Center for Advanced Infrastructure and Transportation (CAIT) at Rutgers University and NJDOT.

These and other transportation technologies are being developed in conjunction with a wider series of technology innovations that are transforming many aspects of life and work for large numbers of people. This includes mobile device apps feeding real time information, increasing power of internet connectivity such as 5G networks—and likely faster successors—and “internet of things” in which mobile devices are tied to other devices in the home and surroundings. They make possible expanded remote work and education and facilitate greater use of on-demand transportation services, discussed elsewhere in this chapter. Integration of technologies in “smart cities” promises more efficient use of public resources to meet community needs. As with most emerging technologies, fully realizing this promise may take many years and comes with potential pitfalls, notably the need to guard against cyber threats and protect user privacy.

Implementation

The NJTPA will continue to coordinate with its partner agencies in pursuing a variety of ITS programs and projects that are helping improve regional travel and preparing the region for the advent of CAV.

in collaboration with the Port Authority, on its bus and rail network; work with the Port Authority of New York and New Jersey on technology to improve operations at the region's bridges, tunnels and at port facilities; and working with the region's freight industry on technologies for efficient goods movement and mitigating environmental and community impacts.

There are several ITS and technology related projects underway and planned in the NJTPA region. Among them are several projects on Route 46 in Essex, Morris and Passaic Counties that will add ITS systems to better manage traffic for a total cost of \$37 million with construction anticipated to begin in 2022. These projects will add dynamic message signs, camera surveillance systems, travel time sensors and traffic signal systems. Another ITS project is underway along Route 78 in Hunterdon, Somerset, and Warren counties at a cost of \$19 million. This project will address congestion and high crash rates, with construction anticipated to begin in 2028.

The technology background paper offers numerous recommendations for guiding the further development and implementation of transportation technology in the region. It recognizes that substantial investments must be made in upgrading and adapting infrastructure for these systems. For the NJTPA, as a planning agency, a crucial role will be helping weave ITS and CAV into the transportation system in ways that best meet local needs and visions while also advancing regional goals. The NJTPA has helped fulfill

these functions for existing ITS systems through its plans and programs, particularly in cooperation with its 15 subregions. As more advanced systems emerge, the NJTPA will have to broaden and extend its planning activities and programs relating to technology.

The NJTPA has many forward-looking planning programs to help integrate emerging technologies into the fabric of travel in the region. For example, a recently completed TDM Plan anticipates seamless travel information systems; a subregional study in Jersey City recommends managing parking demand in part through technology that allows for dynamic pricing and helps identify available parking; and, in conjunction with the School of Computer Science at the New Jersey Institute of Technology, the NJTPA is partnering to explore new uses of Artificial Intelligence to support good planning. In addition, the agency's forecasting and performance measure benchmarking work increasingly harnesses real-time data to analyze existing and future conditions more accurately.

In keeping with the themes of this plan, the NJTPA's planning activities seek to ensure that technology deployment is people-focused—helping address genuine community needs and offering social benefits. While the private sector will lead many aspects of future transportation technology, implementation must be guided in pursuit of the public interest—enhancing job access for low-income workers; helping those without personal autos; providing mobility for people of all ages and abilities; and offering new options for transit access.

This will require ensuring that access to new mobility options is affordable and without barriers based on location. It also favors shared use or multiple passenger vehicles, which will help limit the volume of vehicles on the road and environmental impacts. The NJTPA, through its planning programs and the resources it offers for gathering and sharing data and best practices, can help the region realize the promise of new and potentially transformative technologies over the life of this plan.



Adaptive Signals

Adaptive Signal Control Technology adjusts how long each signal (red, yellow, or green) is displayed to accommodate changing traffic patterns, ease traffic congestion, and improve air quality. Adaptive signals can also be used to hold the “red” phase for vehicles should large numbers of pedestrians be crossing a roadway, such as during a festival or event.

By monitoring traffic with roadway sensors or cameras, adaptive traffic signals change red and green light phasing based on the current traffic conditions. This smooths traffic flows, resulting in improved travel times. Adaptive signal systems are especially effective during disruptive events such as roadway construction and crashes.

In the NJTPA region, adaptive systems are operational on parts Route 1 in Middlesex and Mercer counties; Route 18 in Middlesex County; and Route 1&9 in Hudson County. In the Meadowlands region, adaptive signals have improved traffic flow and safety on county roads such as Paterson Plank Road in this dense, congested area.

Additional adaptive signal projects are being developed along Route 440 and Route 1&9 in Hudson and Union counties; Route 1 in Middlesex and Mercer counties; and Route 23 in Morris and Passaic counties.